



OTHER EDGEWOOD AREAS

Engineering Evaluation/Cost Analysis for the D-Field Area Shoreline

July 2003

U.S. Army Garrison
Aberdeen Proving Ground, Maryland

DISTRIBUTION RESTRICTION STATEMENT
APPROVED FOR PUBLIC RELEASE:
DISTRIBUTION IS UNLIMITED. # 4782-A-1

Engineering Evaluation/Cost Analysis for the D-Field Area Shoreline Aberdeen Proving Ground, Maryland

1.0 SITE CHARACTERIZATION

1.1 Site Description and Background

The D-Field Area consists of approximately 11,000 feet of shoreline extending from Coopers Creek to Target Track Creek. This action addresses the 5,800 feet of shoreline from Briery Point south to Sandy Point in the south (Figure 2-Attachment A). The D-Field Area is located within the secured/restricted range area. Access to the restricted area is limited to properly cleared personnel or individuals in an escorted capacity. A wide variety of physical security countermeasures to include barrier systems, sensors and random patrols by law enforcement personnel are in place to prevent unauthorized access.

The D-Field Area lies in the middle-eastern portion of the Other Edgewood Study Area, on the Edgewood peninsula. The Bush River lies to the east of D-Field (Figure 2-Attachment A). The D-Field area has been used as a test and impact area, and was one of two primary fields in the Edgewood Area used for testing of chemical agents and munitions. Aerial photographs indicate the area was possibly used for demolition and burial of ordnance generated in testing (U.S. Army Corps of Engineers, Baltimore District, 1994). Recent historical record searches located reports documenting testing activities, disposal of munitions, narrow gauge railroad services, burning activities, experiments, and bomb drop tower exercises in D-Field. No information has been found indicating locations and quantities of buried munitions.

Material associated with U.S. Army activities have been observed throughout the D-Field Shoreline and into the waters of the Bush River. Areas of disposal and suspect burn or demolition area have been identified through field reconnaissance and geophysical surveys along the D-Field shoreline. Geophysical surveys have been conducted over 450 acres followed by site inspections of potential disposal areas totaling 250 acres throughout the D-Field Area. Due to the large amount and variation of historical testing activities, the D-Field area contains multiple disposal areas that may include ordnance related components.

1.2 Work Completed To Date

During routine environmental investigation field activities, an area of erosion along the Sandy Point area of the D-Field shoreline containing material associated with historical testing and training activities was discovered on January 20, 2002. Approximately 200 ordnance and ordnance related components were exposed in the eroded shoreline area, along approximately 100 feet of shoreline. The majority of items were 75-mm rounds and 4.2-inch mortars. An Action Memorandum was subsequently submitted to and approved by the United States

Environmental Protection Agency (USEPA) on 31 January 2002 that authorized the initiation of a Time-Critical Removal Action to address material exposed in the area. A total of 252 ordnance and ordnance related components were recovered from the area between 31 January and 28 February 2002. In response to these findings and the likelihood that additional materials were present, a geophysical investigation of the shoreline area and 200 feet inland was initiated. The purpose of the geophysical investigation was to identify an upland disposal area which was the source of the ordnance and ordnance related components within the beach zone. Ordnance and ordnance related components were hand excavated from the shoreline adjacent to the geophysical survey area from the low tide line to the escarpment west of the beach from 29 April through 26 June 2002. An additional 83 items were recovered.

A total of 340 items were removed during the effort including four liquid-filled rounds containing high-confidence mustard, possible chemical, and possible smoke fills. The four liquid-filled rounds were transported to the N-Field bunker for further assessment. Recent field inspections of the 2002 Time-Critical Removal Action area have revealed that additional ordnance related components have been exposed by erosion and are present along the beach zone and near shore environment.

1.3 Source, Nature and Extent of Contamination

The D-Field Area consists of approximately 11,000 feet of shoreline extending from Coopers Creek to Target Track Creek (Figure 2-Attachment A). Materials associated with U.S. Army historical activities including ordnance related components are located throughout the D-Field Area shoreline and into the Bush River. Items identified in the area include 75mm projectiles, 4.2" mortars, stokes mortar fuses, and an MK-82. Materials located along the shoreline include concrete and building debris, an instrumentation stand, and an engine.

No organic constituents were detected in RI samples C04-SW/SD-01 and C04-SW/SD-02 collected from the Bush River along the D-Field shoreline. Arsenic, iron, lead, manganese, and zinc were detected in the surface water samples; only iron and zinc (at 3,790 µg/L and 189 µg/L, respectively) were detected above the U.S. Environmental Protection Agency (USEPA) Biological Technical Assistance Group surface water criteria.

1.4 Streamlined Risk Evaluation

The D-Field Area shoreline contains material resulting from historical testing activities, which may include ordnance related items. These hazardous materials represent a health and safety threat to workers who inadvertently enter the site.

2.0 IDENTIFICATION OF REMOVAL ACTION OBJECTIVES

The Interim Action objective is to reduce the threat to health and safety associated with direct human contact with material.

2.1 Determination of Removal Scope

The Interim Action will address surface and shallow near surface material associated with historical U.S. Army activities located along the D-Field Area shoreline within the footprint of required shoreline stabilization structures. Shoreline disposal sites potentially containing ordnance related components will be addressed under this Action through shoreline stabilization. Similar inland disposal sites containing materials associated with historical U.S. Army activities located throughout the D-Field will be addressed under separate investigations and are not within the scope of this action.

2.2 Determination of Removal Schedule

The response is considered an Interim Action. Site preparation activities (e.g., site policing) will commence Summer 2003; construction activities are anticipated to start Fall 2003. The duration of the selected action is dependent on weather conditions and U.S. Army Aberdeen Test Center test schedule conflicts.

3.0 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

Two alternatives were evaluated in the Engineering Cost Analysis: No Action and Shoreline Stabilization. The alternatives were evaluated on a comparative basis using effectiveness, implementability, and cost as the evaluation criteria.

3.1 Alternative 1 – *No Action*

The No Action alternative would involve no actions specifically intended to address the exposure to materials at the D-Field Area Shoreline and suspect disposal sites. No engineering measures would be implemented to prevent contact with materials. However, access controls would exist with continuance of the existing physical security measures, to include, limiting access to properly cleared personnel or individuals in an escorted capacity as well as a wide variety of physical security countermeasures to include barrier systems, sensors and random patrols by law enforcement personnel to prevent unauthorized access.

The No Action alternative is possibly not protective of human health because contact with hazardous materials would not be controlled or prevented through engineering measures. This alternative is also possibly not protective of the environment because hazardous constituent release to soil, sediment, and surface water is not prevented.

The No Action alternative is easily implemented. No capital cost is associated with this alternative. If a future No Action decision was again made with the CERCLA record of decision (ROD), the only long-term costs would be for 5-year remedy reviews, which would have a present worth cost of approximately \$57,000 for a 30-year period.¹

¹ The Environmental Protection Agency guidance for cost estimates under CERCLA is to estimate the present worth cost for 30 years of operations and maintenance.

3.2 Alternative 2 – Shoreline Stabilization

Alternative 2 would consist of Shoreline Stabilization along 5,800 feet of the D-Field Area Shoreline. This Action will also address surface and shallow near surface materials associated with historical U.S. Army activities located along the D-Field Area shoreline within the footprint of required shoreline stabilization structures. Previously undiscovered shoreline disposal sites potentially containing ordnance related components will be addressed under this Interim Action through shoreline stabilization.

This alternative would be effective in protecting human health and the environment, would meet action objectives, and could be readily implemented. The cost of this alternative is estimated to be \$1,794,000, and consists entirely of capital cost with no long-term operations and maintenance.

4.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

Alternative 2 would be protective of human health and the environment based on current site conditions. The No Action alternative (Alternative 1) would involve no actions to protect either human health or the environment. Alternative 2 would be implemented in a manner that complies with location and action-specific ARARs (fugitive dust emissions, erosion and sediment control, etc.) and meets remedial action objectives. The No Action alternative would possibly not meet remedial action objectives. The No Action alternative would not achieve long-term effectiveness. Alternative 2 (Shoreline Stabilization) is a permanent remedy that is dependent on land use controls, including access controls, to ensure long-term effectiveness. Both Alternatives are readily implemented (technically feasible, implementable with readily available equipment and materials, and administratively feasible).

The No Action alternative would involve costs only for 5-year remedy reviews if the no action decision was carried forward as a long-term remedy in the Record of Decision (ROD). The estimated costs of the two alternatives are:

No Action	\$57,000
Shoreline Stabilization	\$1,794,000

The two alternatives have been evaluated for environmental considerations under the National Environmental Policy Act (NEPA). Table 1 presents a discussion of potential environmental impacts and satisfies NEPA requirements.

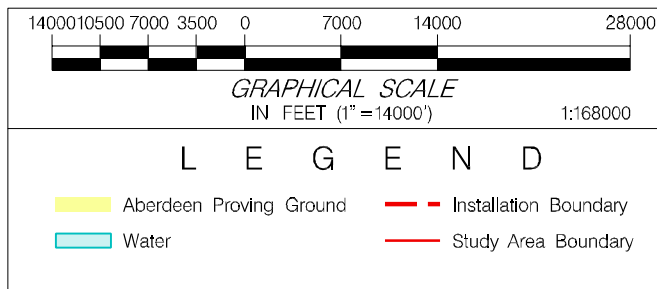
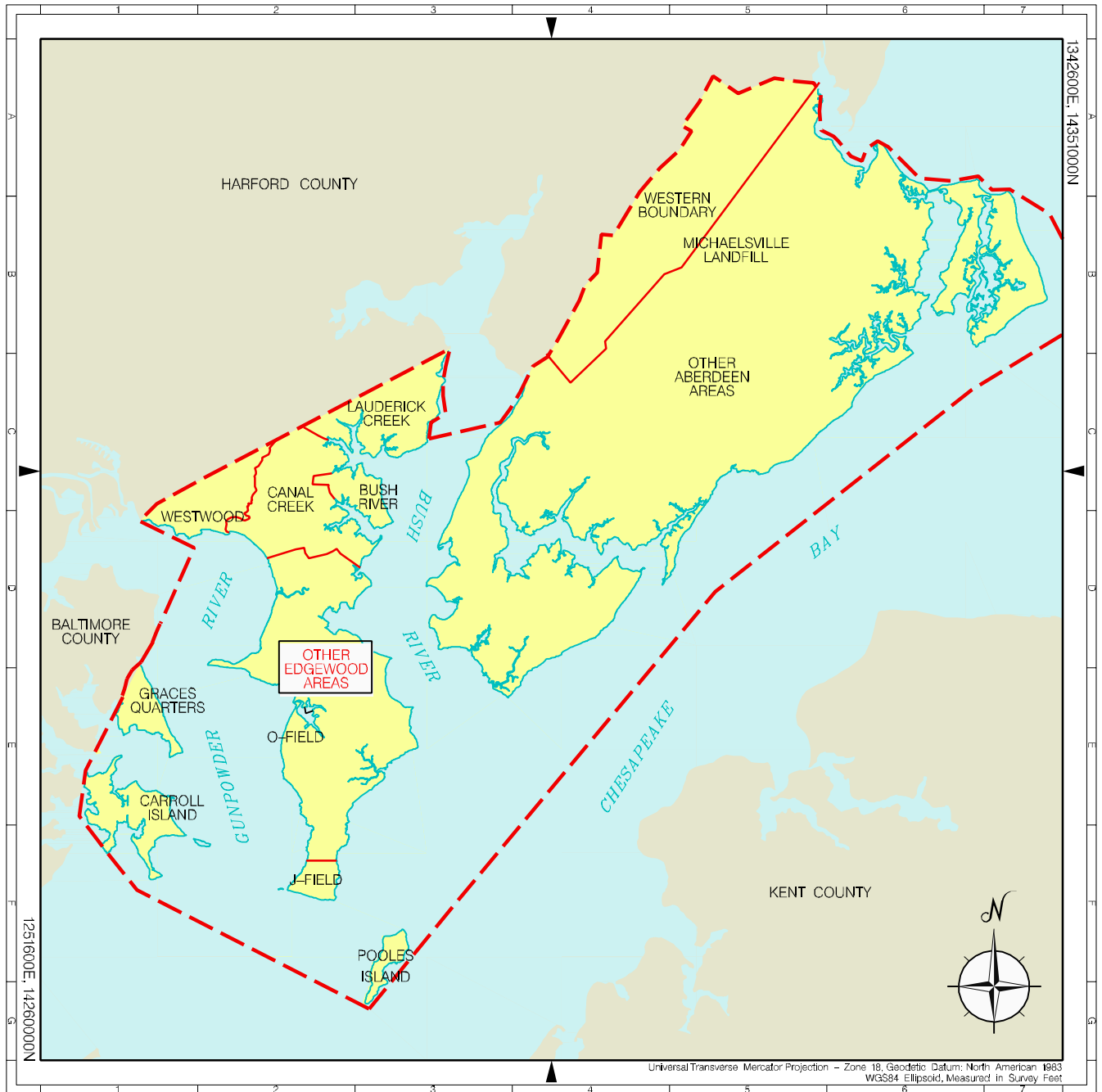
5.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE


Shoreline Stabilization (Alternative 2) is recommended because it offers the highest degree of protectiveness. The selected action is a permanent remedy that is dependent on land use controls, including access controls, to ensure long-term effectiveness. Alternative 2 provides long-term effectiveness and permanence in preventing exposure of materials including ordnance related components through the long-term maintenance of shoreline erosion controls.

Table 1. Environmental Considerations for Interim Action Alternatives

	Alternative 1 No Action	Alternative 2 Shoreline Stabilization
WETLANDS	No impacts	D-Field Shoreline is along the Bush River and implementation would need to be such that impact on the Bush River is minimized
ARCHEOLOGICAL RESOURCES	No impacts	No impacts
THREATENED / ENDANGERED SPECIES	No impacts	No impacts.
SEDIMENT AND EROSION CONTROL	No impacts	Implementation would require stabilization of the shoreline where removal of material occurs.
NOISE POLLUTION	No impacts	Noise control measures may need to be implemented to minimize impacts during any necessary on-site detonation of unexploded ordnance
HAZARDOUS WASTE	No actions would be taken to mitigate threats associated with material present at the D-Field Shoreline and near shore Disposal Sites	Shoreline stabilization would eliminate any possible threats associated with direct human contact with hazardous material. Wastes removed during site preparation would be managed in accordance with Federal, State, and Army regulations.
AIR POLLUTION	No impacts	Proper procedures would need to be implemented to control emissions of dust

Attachment A

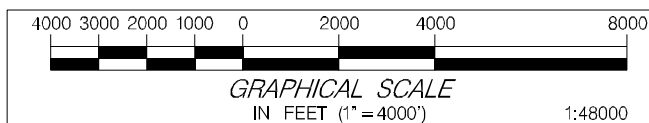
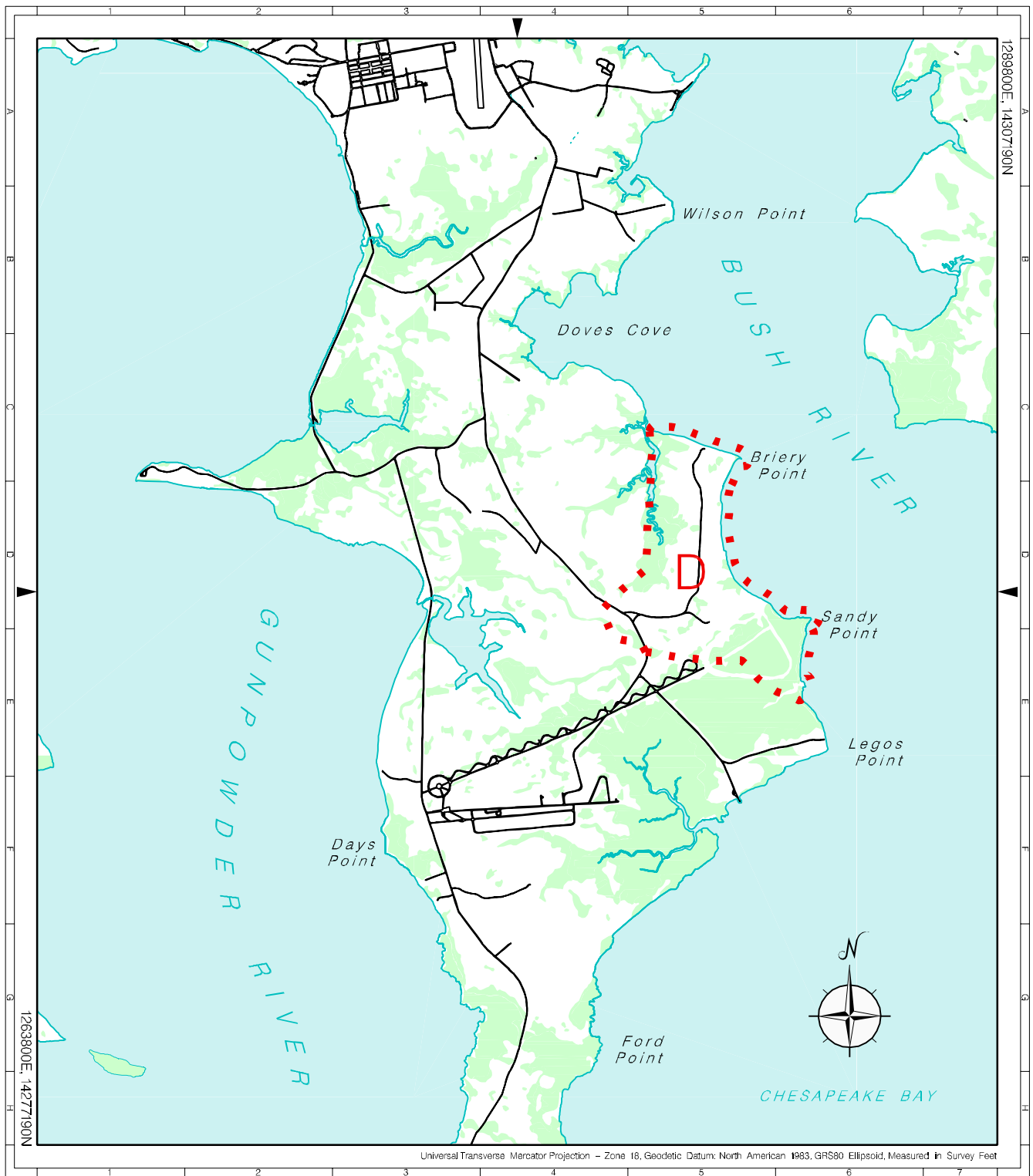


 6095 Marshalee Drive
Elkridge, MD 21075 (800) 727-6677
www.gpworldwide.com

TITLE:

**LOCATION OF THE
OTHER EDGEWOOD AREAS**

CARTOGRAPHER: M. BROOKS	APPROVED BY: M. DUNKERLY	DATE: 09-25-02	FIGURE: 1
-----------------------------------	------------------------------------	--------------------------	---------------------



LEGEND

— Roads Water Wetlands



6095 Marshalee Drive
Elkridge, MD 21075

(800) 727-6677
www.gpworldwide.com

TITLE:

OTHER EDGEWOOD AREAS D-FIELD AREA

CARTOGRAPHER:

B. JOYCE

APPROVED BY:

M. BROOKS

DATE:

01-24-03

FIGURE:

2